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DESCRIPTIONS OF

EIGHT NEW SPECIES OF FOSSILS

FROM THE

CAMBRO-SILURIAN ROCKS OF MANITOBA.

BY J. F. WHITEAVES.

FROM THE
TRANSACTIONS OF THE ROYAL SOCIETY OF CANADA
VOLUME VII, SECTION IV, 1889.

ILLUSTRATED BY SIX PLATES

MONTREAL, NOVEMBER, 1889.
DAWSON BROTHERS, PUBLISHERS.

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VI.—*Descriptions of eight New Species of Fossils from the Cambro-Silurian Rocks of Manitoba.* By J. F. WHITEAVES. [Plates XII to XVII.]

(Read May 8, revised Oct. 26, 1889.)

GASTEROPODA.

MACLUREA MANITOBENSIS. (N. Sp.)

(Plate XII, and Plate XIII, figs. 1 and 2.)

Shell large, attaining to a maximum diameter of eight inches and a half, and consisting of about five somewhat slender volutions which increase rather slowly in size: outer volution nearly always distinctly angulated at the periphery. Left side almost flat, but faintly depressed in the centre in some specimens and as faintly raised in others: volutions, as viewed on the flat side, very shallowly concave in the centre and slightly raised on their outer margins: suture lightly impressed. Right side moderately convex (the greatest thickness or depth varying in different examples from two fifths to one third the maximum diameter): somewhat conical or subhemispherical, the outer volution obliquely flattened and narrowing very rapidly, but in a few specimens somewhat convexly, from the periphery to the umbilical margin: umbilicus deep, conical, and apparently about equal in breadth to one fourth of the maximum diameter, though in all the specimens collected the test is either imperfect or absent at the umbilical margin: aperture obliquely and rather narrowly subtrapeziform: outer lip apparently simple: test thick.

Surface of the test on the left or flat side marked with irregularly disposed, but for the most part distant, transverse linear grooves or periodic arrests of growth, each of which curves gently backward in a very shallowly convex curve, and occasionally with a few striations which run parallel to them. In one of the specimens figured (Plate XIII, fig. 1) which is a little less than four inches in its greatest diameter, and in which the whole of the test is preserved on the flat side, there are six of these periodic arrests of growth on the outer volution, while the inner whorls are perfectly smooth. In larger but similarly preserved specimens these arrests of growth, which are not sufficiently deep to produce any impressions on the casts, are somewhat more numerous and disposed at still more unequal intervals. On the right or convex side the test is ornamented with rounded spiral ribs of nearly equal size, and these are crossed by similarly shaped, straight and transverse costæ, in such a way as to present a somewhat nodulous appearance. The spiral ribs, however, seem to be rather broader than the narrow furrows between them, while the transverse costæ are apparently equal in breadth to the regularly concave grooves which alternate with them.

The foregoing description is intended to apply only to those specimens in which the greater part of the test is preserved. The condition in which the species is usually obtained is that of mere casts of the interior of the shell. In these, the slender early whorls are often broken off, the suture, on the flat side, is deeply excavated or channeled, and, on the convex side, a large portion of the inner whorls is visible in the umbilicus. The whole of the thick test between the volutions is sometimes naturally removed in these casts, in which case the volutions are completely separated.

In Appendix 1 to the Narrative of Franklin's Second Expedition to the Shores of the Polar Sea, under the heading "Limestones of Lake Winnipeg," the discovery, among other fossils, of specimens of a Maclurea which is most probably identical with the present species, on the western shore of that lake, in 1825, is thus referred to by Sir John Richardson:—"Professor Jameson enumerates terebratulæ, orthoceratites, encrinites, caryophyllitæ and lingulæ, as the organic remains in the specimens brought home by Captain Franklin on his first expedition. Mr. Stokes and Mr. James De Carle Sowerby have examined those which we procured on the last expedition, and found amongst them terebratulites, spirifers, maclurites and corallines. The maclurites belonging to the same species with specimens from Lakes Erie and Huron, and also from Igloolik, are perhaps referable to the *Maclurea magna* of Le Sueur."

A few casts of the interior of shells which are certainly referable to *M. Manitobensis* were collected by Mr. John Fleming in 1858 at Limestone Point, Lake Winnipeg, eleven miles north of the Little Saskatchewan, and by Prof. H. Youle Hind, in the same year, at Deer Island, near Grindstone Point and at Punk Island, on the same lake. These specimens, which are still in the Museum of the Survey, are referred to by Mr. E. Billings, in chapter 20 of Prof. Hind's report, as belonging to a species of Maclurea, "allied to *M. Logani*, Salter, but with more slender whorls."

Since then the species has been collected at the following localities, but the first specimens known to the writer in which any considerable portion of the test is preserved were obtained in 1884, by Mr. T. C. Weston at Pike Head and Kinwow Bay, Lake Winnipeg, and by Mr. McCharles at East Selkirk. Between Fort Alexander and the mouth of the Red River, Dr. R. Bell, 1874. At the second and third rapids of the Nelson River, Keewatin, Dr. R. Bell, 1879. Elk Island, Big Island, Grindstone Point, Washow Bay, Bull Head Bay, Dog's Head, Pike Head or Jackfish Bay, and Kinwow Bay, all in or on Lake Winnipeg; T. C. Weston, 1884. East Selkirk, Manitoba, T. C. Weston and A. McCharles, 1884. North end of Big Island, Big Grindstone Point and Swampy Island, Lake Winnipeg, J. B. Tyrrell, 1889.

In the writer's judgment, *M. Manitobensis* is much more nearly allied to the *M. Bigsbyi* of Hall (from the lower part of the Buff limestones of the Trenton group at various localities in southern Wisconsin) and to the *M. cuneata* of Whitfield (from the upper portion of the Trenton group, or Galena limestone of Wisconsin and Iowa) than it is to either *M. magna* or *M. Logani*. Still, the oblique flattening of the convex side of the outer volution in the present species and its distinctly angulated periphery would seem to separate it sufficiently from *M. Bigsbyi*, while its comparatively broad umbilicus and more sle r volutions would apparently prevent its reference to *M.* surface of the shell of *M. Bigsbyi*, too, as seen in the matrix, is described as only with "strong revolving striæ."

CEPHALOPODA.

POTERIOCERAS NOBILE. (N. Sp.)

(Plate XIV, fig. 1.)

Shell very large, attaining to a length of upwards of seven inches, straight, subturbinate, about one third longer than broad and broadest a little in advance of the mid-length, considerably inflated but slightly compressed, one side being flatter than the other, so that the outline of a transverse section through the broadest part would be nearly elliptical, and the dorso-ventral diameter about one fourth greater than the lateral. Septate portion increasing rather rapidly in size from the apex: body chamber rather large, occupying more than one third but less than half the entire length, and narrowing gradually and somewhat convexly to the aperture: characters of the aperture unknown, though, as far as can be made out in the most perfect specimen collected, it appears to have been simple and entire, as well as apparently rather large and subovate in outline.

Sutures, or outer edges of the septa, neariy straight all round, parallel, and, in the specimen figured, placed at a distance of eight millimetres apart at or near the (imperfect) posterior end, while the four nearest to the body chamber appear to have been about fourteen millimetres apart. In places where the test has been broken off and the cast of the interior exposed, the septa are often seen to be coarsely crenulated. Surface markings and shape and position of the siphuncle unknown.

Dimensions of the most perfect specimen known to the writer (in which, however, about two chambers are broken off at the posterior end):—length, 177 millimetres; maximum dorso-ventral diameter, 124 mm.; greatest lateral diameter (approximately) about 98 mm.

East Selkirk, Manitoba, T. C. Weston, 1884: one badly preserved and somewhat distorted but otherwise nearly perfect specimen, and a large fragment of another, consisting of the greater part of the septate portion of the shell. Lower Fort Garry, Manitoba, T. C. Weston, 1884: one very imperfect specimen, consisting also of most of the chambered portion of the shell.

This species is provisionally referred to *Poterioceras*, on account of its supposed simple and entire aperture, but it may prove to be a true *Gomphoceras*.

The genus *Poterioceras* was thus originally defined by M'Coy:—"Shell fusiform, short; mouth contracted; siphuncle dilated between the chambers, eccentric. Distinguished from the true *Orthoceratites* by its short fusiform contour, and contracted mouth." This diagnosis is accompanied by a small diagram, which shows that although the body chamber narrows rapidly from its commencement up to the aperture, yet that the aperture itself is simple and entire, and neither T-shaped or lobate as in Gomphoceras, nor contracted in the middle and expanded at both ends as in Phragmoceras.

The validity of the genus *Poterioceras* is not recognized by Barrande, Fischer, Zittel and others, who place the name among the synonyms of *Gomphoceras*. On the other hand, in the first part of his Monograph of the British Fossil Cephalopoda, the Rev. Prof. Blake accords full generic rank to *Poterioceras* on the ground that "the only species described by M'Coy, as well as his diagram, indicates a genus with the form of a *Gomphoceras* without its peculiar aperture." In the same volume, Prof. Blake contends that *Oncoceras*, Hall, is synonymous with ***Poterioceras***, and states that Prof. Hall's "actual type, as well as others which have been referred to the genus, in no respects differ from M'Coy's genus." To this contention the present writer feels compelled to demur, as the statement by which it is supported seems to be at variance with the known facts of the case. If the genus ***Poterioceras*** is to be retained at all, in the sense in which it was defined by M'Coy, the name will probably have to be restricted to those straight, *Gomphoceras*-like shells in which the aperture is simple and entire, and it is in accordance with this definition of its characters that the name will be used in the present paper. In Oncoceras, on the other hand, the shell is always distinctly curved and inflated in a peculiar manner in advance of the mid-length, while its body chamber is transversely constricted just behind the aperture. According to Prof. Hall, the aperture of Oncoceras is constricted, but as Mr. E. Billings asserts that it is oval,[1] the constriction referred to by Hall may have been meant to refer to that immediately behind the aperture.

In the outline drawing of the species on Plate XIV, although the contour and exact dimensions of the original are correctly represented, the sutural lines are slightly restored and the supposed outline of the aperture, on one side of the specimen, is indicated by a dotted line.

POTERIOCERAS APERTUM. (N. Sp.)

(Plate XIV, figs. 2 to 4.)

Shell much smaller than that of the preceding species, straight, though in some specimens there is a scarcely perceptible curvature at the apical end, varying in contour from ovately subfusiform to rather narrowly subovate, about one third longer than broad, slightly compressed, but a little flatter on one side than the other, so that the outline of a transverse section through the broadest part would be elliptical or ovately subelliptical, the venter being sometimes slightly broader than the dorsum: body chamber truncated anteriorly. Septate portion narrowly rounded at the apex in some specimens but more pointed in others, and increasing rather rapidly in size, especially in the dorso-ventral direction: body chamber occupying about one third of the entire length, and narrowing very gently and in some cases somewhat convexly towards and up to its anterior termination: aperture simple, open, not much narrower than the posterior part of the body chamber, and narrowing apparently into a short, shallow and backwardly directed sinus a little on or to one side of the middle of the venter.

The surface markings are very imperfectly preserved, but the test appears to have been nearly smooth and marked only with a few faint lines of growth.

Sutures straight and parallel, the last two septa, at least, being coarsely crenulated; siphuncle inflated between the septa, placed near the outer margin, and a little on one side of the centre of one of the flattened sides.

The dimensions of the largest specimen collected (fig. 2) are as follows:—length, 124 millimetres (or nearly five inches); maximum dorso-ventral diameter, seventy-four mm.; greatest lateral diameter, fifty-eight mm. In the other specimen represented on Plate XIV

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[1] Geol. Surv[illegible], Rep. Progr. 1853-56, p. 311.

(fig. 3), the length along the median line is sixty-six millimetres, the maximum dorso-ventral diameter forty-seven mm., and the greatest lateral, forty.

Dog's Head, Lake Winnipeg, T. C. Weston, 1884, and Swampy Island, in the same lake, J. B. Tyrrell, 1889 ; three nearly perfect but badly preserved specimens from each of these localities.

The siphuncle seems to have been placed a little nearer to the dorsal than to the ventral side, but the only specimen in which any remains of this part of the shell can be detected is so much worn that its relative position is uncertain.

This species possesses many characters that are common to it and to the brevicone Orthoceratites for which Professor Hyatt has constituted the genus *Rizoceras*, but it differs materially from that group or genus in the circumstance that its body chamber always narrows distinctly from its commencement to the aperture. From *P. nobile* it seems to be readily separable by its much smaller size, more slender contour, and more compressed sides.

ONCOCERAS MAGNUM. (N. Sp.)

(Plate XV, fig. 1.)

Shell very large, attaining a length of at least eight inches,[1] slightly but distinctly curved, somewhat fusiform but much more convex on the dorsal than on the ventral side, and contracted at both ends ; sides compressed, though one side is flatter than the other, so that the outline of a transverse section through the thickest part would be nearly ovate, the dorsum being broader than the venter; maximum dorso-ventral diameter about twice as great as the lateral, and nearly equal to one half of the entire length. Septate portion increasing rather slowly in size from the posterior end to a little in advance of the mid-length, after which it narrows somewhat more rapidly, especially on the dorsal side; its dorsal margin not only uniformly convex, but distinctly gibbous anteriorly, while its ventral margin is shallowly concave behind and slightly convex in front. Body chamber oblique, short and occupying about one third the entire length; at its commencement posteriorly, it is broad, especially in a dorso-ventral direction, and bounded by a deep oblique groove, which is broader on the dorsum than on the venter, and parallel to the septa nearest to it; in front of this groove the chamber narrows rapidly, but at first convexly, towards the aperture, behind which there is a broad and shallowly concave constriction. In the most perfect specimen known to the writer, the characters of the aperture are very imperfectly shown, but it appears to have been simple, entire, rather narrow and subovate, with its lateral margins obliquely truncated; there are also some indications that it narrowed into a short sinus on the ventral side.

Sutures oblique, the septa being broader on the dorsum than on the venter, nearly straight on the sides but faintly convex on the dorsum, and slightly concave on the venter; siphuncle inflated between the septa, nummuloidal, endogastric, and placed very near to the ventre, but not quite marginal.

Surface markings unknown.

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[1] In an imperfect and water-worn cast of a shell collected by Mr. Tyrrell at Swampy Island this summer, which is probably referable to this species, the length is fully eleven inches.

Approximate dimensions of the most perfect specimen collected :—actual length along the median line of the most convex side, 179 millimetres, or about seven inches and a half (but as a considerable piece is broken off the posterior end, its entire length when perfect was probably an inch longer than this) ; maximum dorso-ventral diameter of the same, 106 mm. ; greatest lateral diameter, 55 mm.

The beautiful specimen figured, which is a well preserved cast of the interior of the shell, collected by Mr. U. Chesterton at East Selkirk, was recently presented to the Museum of the Survey by the President (Mr. Charles N. Bell) and members of the Manitoba Historical and Scientific Society. A similar but less perfect specimen was obtained at the same locality in 1884 by Mr. T. C. Weston.

ONCOCERAS GIBBOSUM. (N. Sp.)

(Plate XV, figs. 2 and 3.)

Shell resembling that of the preceding species in external form and apparently also in the characters of its interior, but differing therefrom only in its much smaller size. Thus, the smallest specimen of *O. magnum* known to the writer must have been a little more than eight inches in length, when perfect, and the largest fully eleven, whereas in the present species, out of fourteen specimens collected, the smallest could not have been more than three inches and a half long when perfect, and the largest four and a half. These two series of specimens, too, do not seem to be connected by any intermediate gradations in size.

In one of the specimens of *O. gibbosum* from Swampy Island, the surface of the test of the septate portion is faintly costulate transversely, as represented on fig. 3.

Big Island, Washow Bay, Bull Head Bay, and Jack Fish Bay or Pike Head, Lake Winnipeg, T. C. Weston, 1884 : three specimens from Jack Fish Bay, and one from each of the other localities.

Swampy Island, Lake Winnipeg, J. B. Tyrrell, 1889 : seven specimens.

CYRTOCERAS MANITOBENSE. (N. Sp.)

(Plate XIII, figs. 3 and 4, and Plate XV, fig. 4.)

Shell very slightly curved, slender, elongated and narrowly subfusiform, moderately inflated a little in advance of the mid-length, though the dorsal margin, in a full lateral view, is much more convexly curved than the ventral ; posterior extremity narrower and more pointed than the anterior ; body chamber short, occupying less than one third of the entire length, and narrowing gradually to the somewhat obliquely truncated anterior end ; aperture rather large, simple and open, with a broad and shallowly concave constriction immediately behind it, but only on the ventral side ; outline of a transverse section through the broadest part ovate, the dorsum being narrower than the venter.

Surface of the test on the septate portion longitudinally ribbed.

Sutur [illegible] arched on the [illegible] produced into moderately simple sad [illegible] and into [illegible] t less prominent saddles

Siphuncle exogastric, and placed very near to the dorsum, but not quite marginal. In the original of fig. 4 on Plate XV, which is an artificial and longitudinal section through the centre of a specimen from Bull's Head, the siphuncle is nearly cylindrical, but very slightly expanded between the septa and as slightly contracted where it intersects them.

Dimensions of the most perfect specimen collected:—actual length along the median line of one of the sides, 129 mm.; estimated total length of the same, when perfect, 133.5 mm.; maximum dorso-ventral diameter of the same, 34.5 mm.; greatest lateral diameter, 31.5.

Big Island, Deer Island, Punk Island, Big Grindstone Point, Bull's Head, Dog's Head, and Pike Head or Jackfish Bay, Lake Winnipeg, T. C. Weston, 1884. One nearly perfect specimen is from Big Island (Plate XIII, fig. 3) and another from Bull's Head (Plate XV, fig. 4) the rest being for the most part only pieces of the posterior and septate portion of the shell.

Deer Island, Lake Winnipeg, J. B. Tyrrell, 1889: the most perfect specimen known to the present writer, the original of fig. 4 on Plate XIII.

TROCHOCERAS McCHARLESI. (N. Sp.)

(Plate XVI.)

Shell very large (the only specimen known to the writer, which is septate throughout, having a maximum diameter of ten inches and a half) and composed of about three apparently separate but closely contiguous volutions, which are circular in transverse section and which increase rather slowly in size: they are also slightly asymmetrical and enrolled on very nearly but not quite the same plane, the spire being sunk a little below the highest level of the outer whorl.

Surface of the outer volution marked by very numerous, close-set, rounded and flexuous ribs, which are rather narrow but unequal in size, with an average breadth of about three millimetres. Across the sides the ribs curve obliquely and more or less convexly backward, and on the periphery they form a series of broad, shallowly concave and backwardly directed sinuses.

The sutural lines run parallel with the ribs on the test, but are placed much further apart, the average distance between the septa being about nineteen millimetres. Position of the siphuncle unknown.

The writer has much pleasure in associating with this fine species the name of its discover, Mr. A. McCharles, formerly of Winnipeg, to whom the Survey is indebted for many choice and some apparently unique specimens of fossils from that part of the Red River valley which runs through Manitoba. The specimen figured, which is represented as slightly smaller than the natural size, and which is now in the Museum of the Survey, was collected by Mr. McCharles in 1884 at East Selkirk. About one third of this specimen has been broken off, but the part remaining presents a very instructive transverse section of the shell at a right angle to the direction of the volutions. A considerable portion of the test is well preserved on the outer volution, and in those places where the test has been accidentally removed, the characters of the septa are well shown. The two inner whorls are not nearly so well preserved as the outer volution, and the asymmetry and separation of all three are best exhibited in the transverse section afforded by the specimen.

APSIDOCERAS INSIGNE. (N. Sp.)

(Plate XVII.)

This name is proposed for a large fragment, consisting of a cast of the interior of nearly one half of the outer volution, of a huge nautiloid shell from the Hudson River formation at Stony Mountain, Manitoba, which evidently belongs to the genus *Apsidoceras* of Hyatt.[1] The specimen is nearly a foot in length, as measured in a straight line, or sixteen inches, if the curvature of the abdomen be followed, and the dorso-ventral diameter of the tube of which it is composed is five inches at the larger end. At its anterior extremity a portion of the body chamber is preserved and in the rest of the specimen twenty septa can be counted.

The whorls appear to have been just in contact, and they were evidently coiled on the same plane: the umbilicus is broad and deep, its breadth in the actual specimen being about five inches: and, although not a vestige of the shell is preserved, the surface appears to have been smooth. The periphery or abdominal region is broad and flattened, the lateral angles are tolerably distinct, and the sides, which are convex near these angles, narrow rapidly to the inner edge or dorsum. As far as can be ascertained, in the imperfect and somewhat distorted state of the specimen, the outline of a transverse section of the outer whorl at its thickest end, and probably that of its aperture also, would be very broadly subovate, with the larger end of the ovoid truncated, the dorso-ventral and lateral diameters in this region being nearly equal.

The septa are about twelve millimetres apart in the centre of the periphery or abdominal region, and about five millimetres apart on the narrow dorsum. Each suture has a broad and angular sinus or lobe on the abdomen or venter and a corresponding and similar saddle on both of the outer and lateral angles. On the sides, the sutures are nearly straight or very faintly concave, while those on the dorsum are so imperfectly preserved that it is scarcely possible to trace them throughout their entire course, though each suture in this region seems to have been shallowly curved in such a way as to form a small and feebly developed saddle on each side, with a similar lobe or sinus in the middle. The angularity of the lobes and saddles on the venter and ventro-lateral angles is most marked near the body chamber. All the lobes and saddles, too, are of the simplest type, their margins being entire throughout.

The fine specimen upon which the preceding description is based was presented to the Museum of the Survey in the spring of 1889 by the President and members of the Manitoba Historical and Scientific Society.

A. insigne is more nearly related to the *Nautilus Hercules* of Billings,[2] from the Hudson River formation of Anticosti, which is probably an *Apsidoceras*, than to any other species known to the writer. Still the two forms appear to be totally distinct, for *N. Hercules* is a much smaller shell (the maximum diameter of the type of that species being only a little over six inches) its aperture is broadly reniform, with a lateral diameter nearly double that of the dorso-ventral, its volutions have no ventro-lateral angulation, and its sutural lines are nearly straight, not only on the sides but also upon the abdomen or venter.

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[1] Bost. Soc. Nat. Hist. Proc. 1883, xxii. 289.

[2] Described Geol. Surv. Can., Rep. Progr., 1853-56, pp. 306, 307.

The exact stratigraphical relations of the subdivisions of the Cambro-Silurian rocks of Manitoba have yet to be ascertained. On purely palæontological evidence, the highly fossiliferous deposits at Stony Mountain were referred to the Hudson River formation by the present writer, in 1880,[1] and the fossils of the pale buff-coloured limestones or dolomites of East Selkirk and Lower Fort Garry have long been supposed to show that these rocks are the equivalents of the Galena limestone or upper portion of the Trenton formation, of Wisconsin and Iowa. On the same evidence, the somewhat similarly coloured and fossiliferous limestones of the islands and shores of Lake Winnipeg, appear to be of the same age as the Trenton Limestone proper, or, at any rate not older than the Birdseye and Black River Group of Eastern Canada and the State of New York. It is possible that the fossiliferous rocks on the shores and islands of Lake Winnipeg may be a little lower down in the series than those at East Selkirk and Lower Fort Garry, but the whole of these deposits, apart from those at Stony Mountain and elsewhere in Manitoba which can be somewhat confidently referred to the Hudson River group, probably represent only one well defined horizon in the Cambro-Silurian system. However this may be, in the writer's judgment, there is at present no satisfactory palæontological evidence for the existence of the Chazy formation or its equivalent, in Manitoba.

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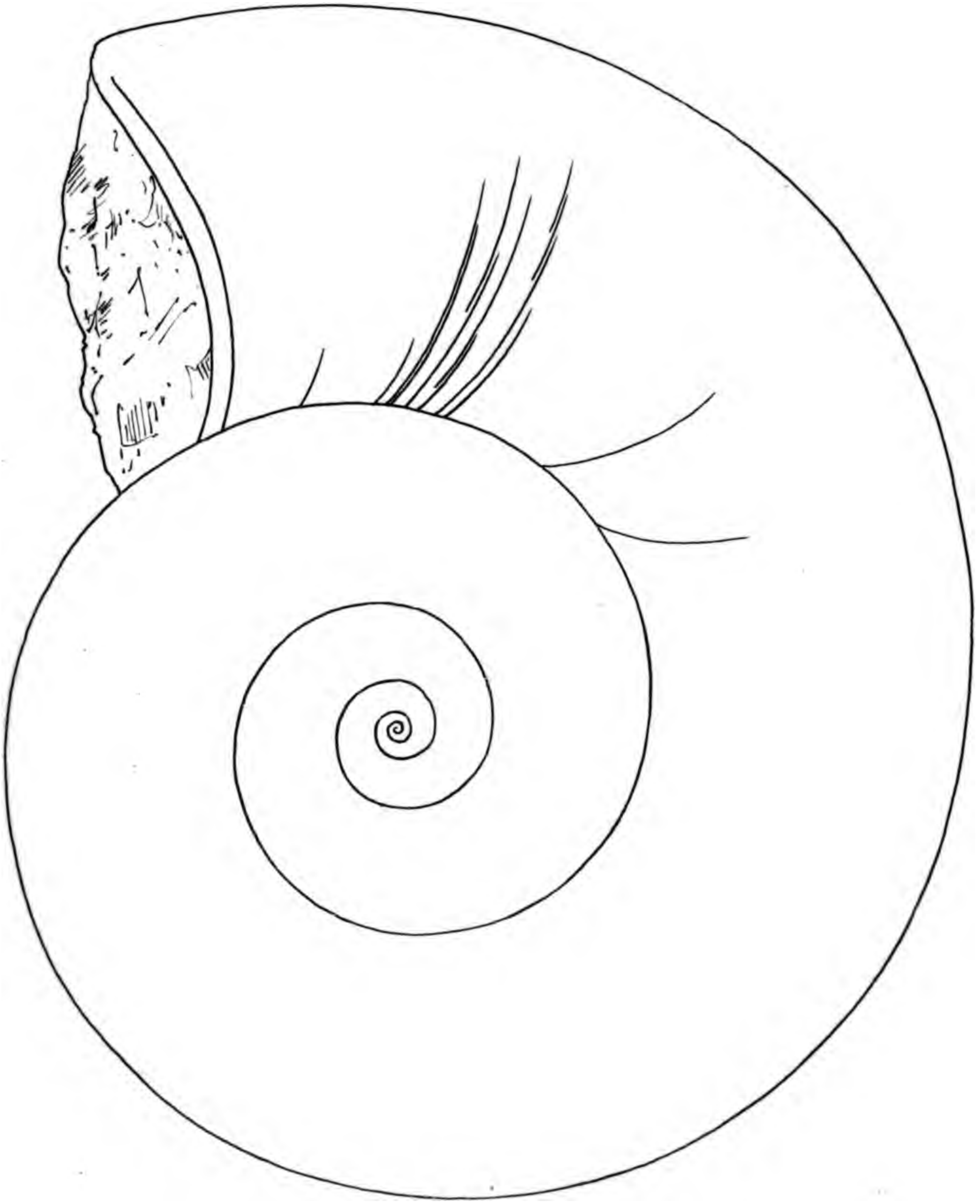
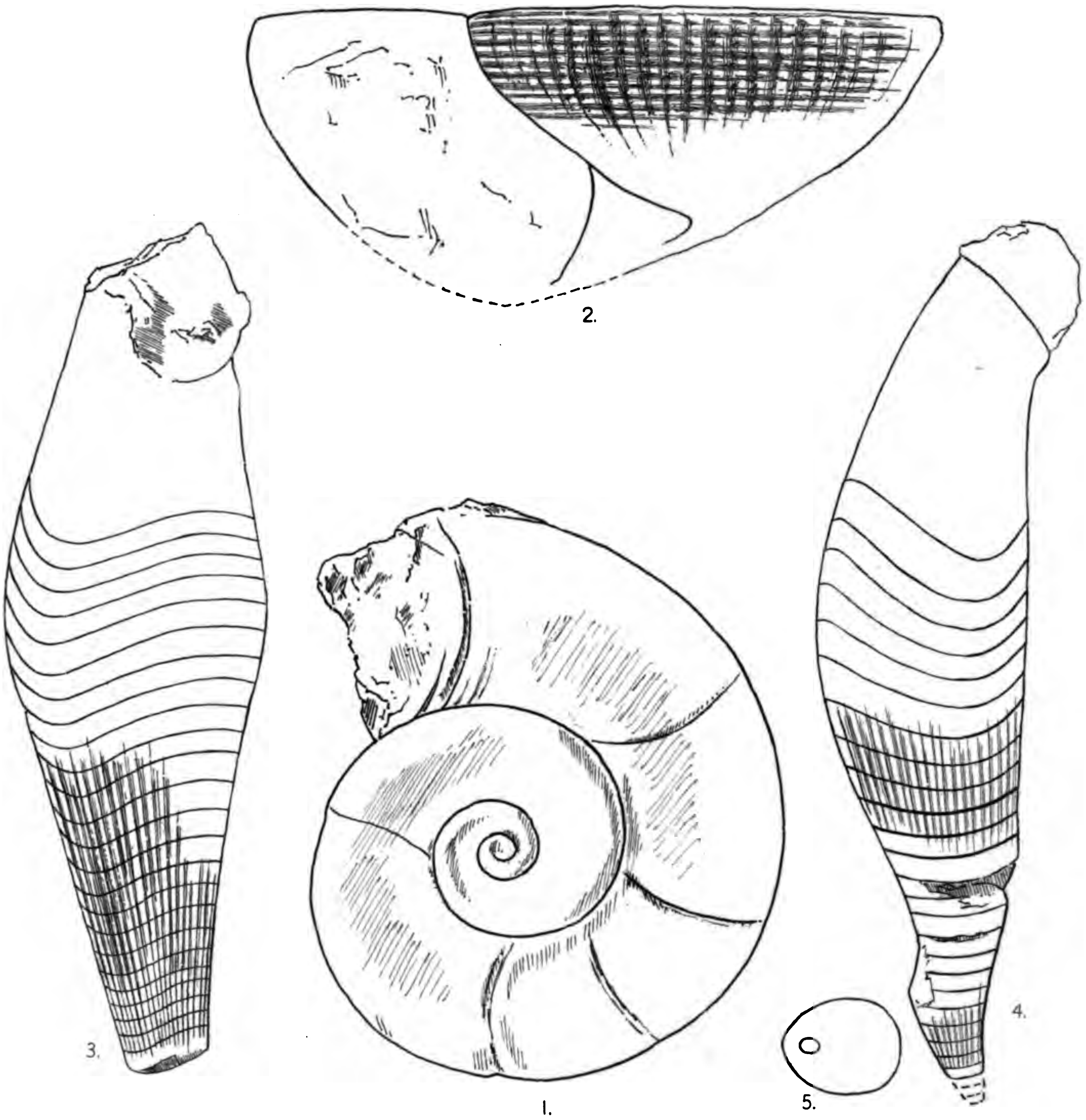
[1] Geol. Surv. Can., Rep. Progr., 1878-79, p. 50 c.



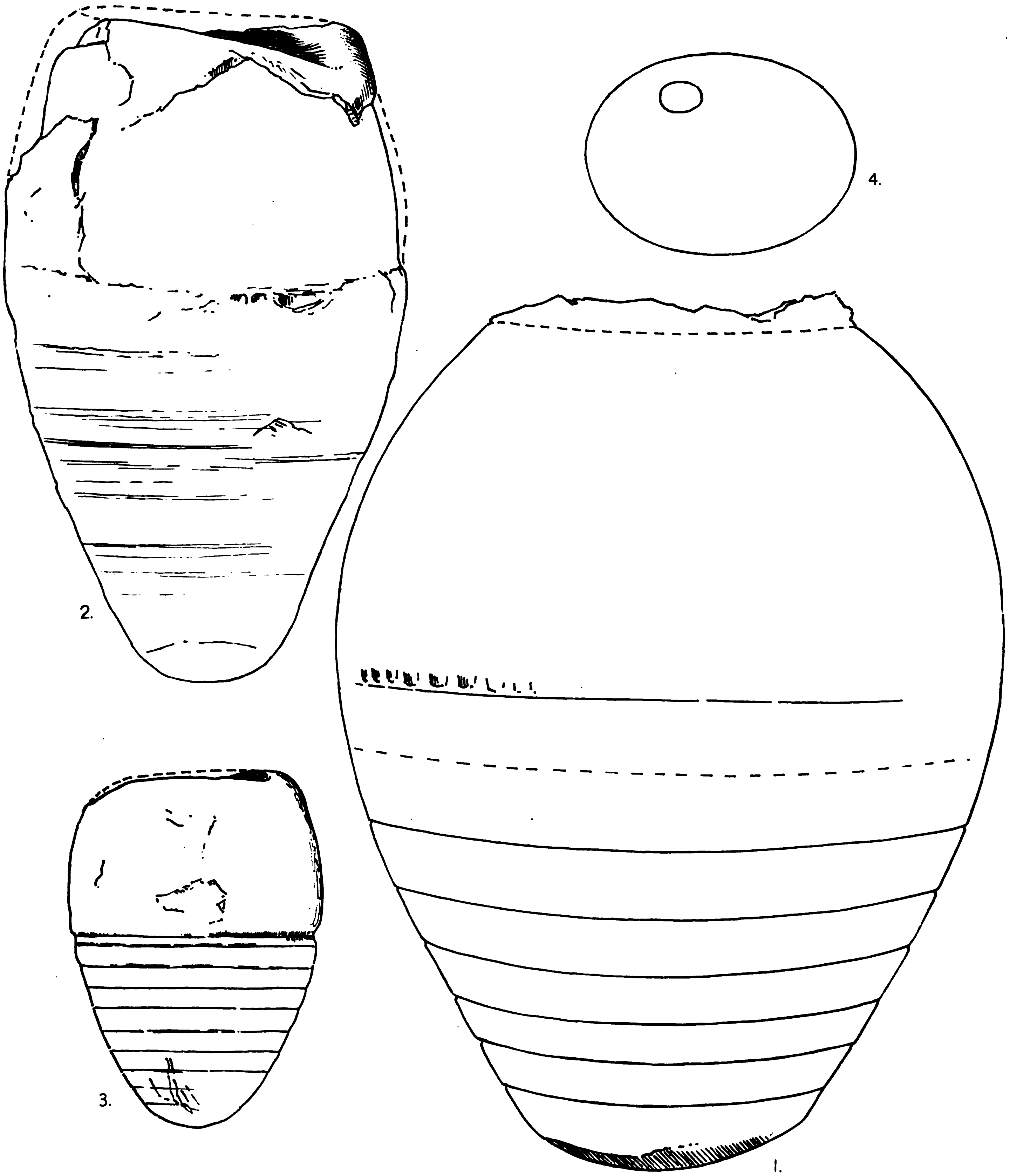
L. M. LAMBE, DEL.

Maclurea Manitobensis.—Left side of a specimen from East Selkirk. Natural Size.



L. M. LAMBE, DEL.

1 and 2.—*Maclurea Manitobensis.*—(1) Left side of a specimen from Pike Head; and (2) Front view of another from Kinwow Bay. 3—5.—*Cyrtoceras Manitobense.*—(3) Distorted example from Big Island; (4) Specimen from Deer Island; and (5) Septum of a specimen from Bull Head. All the figures are of natural size.

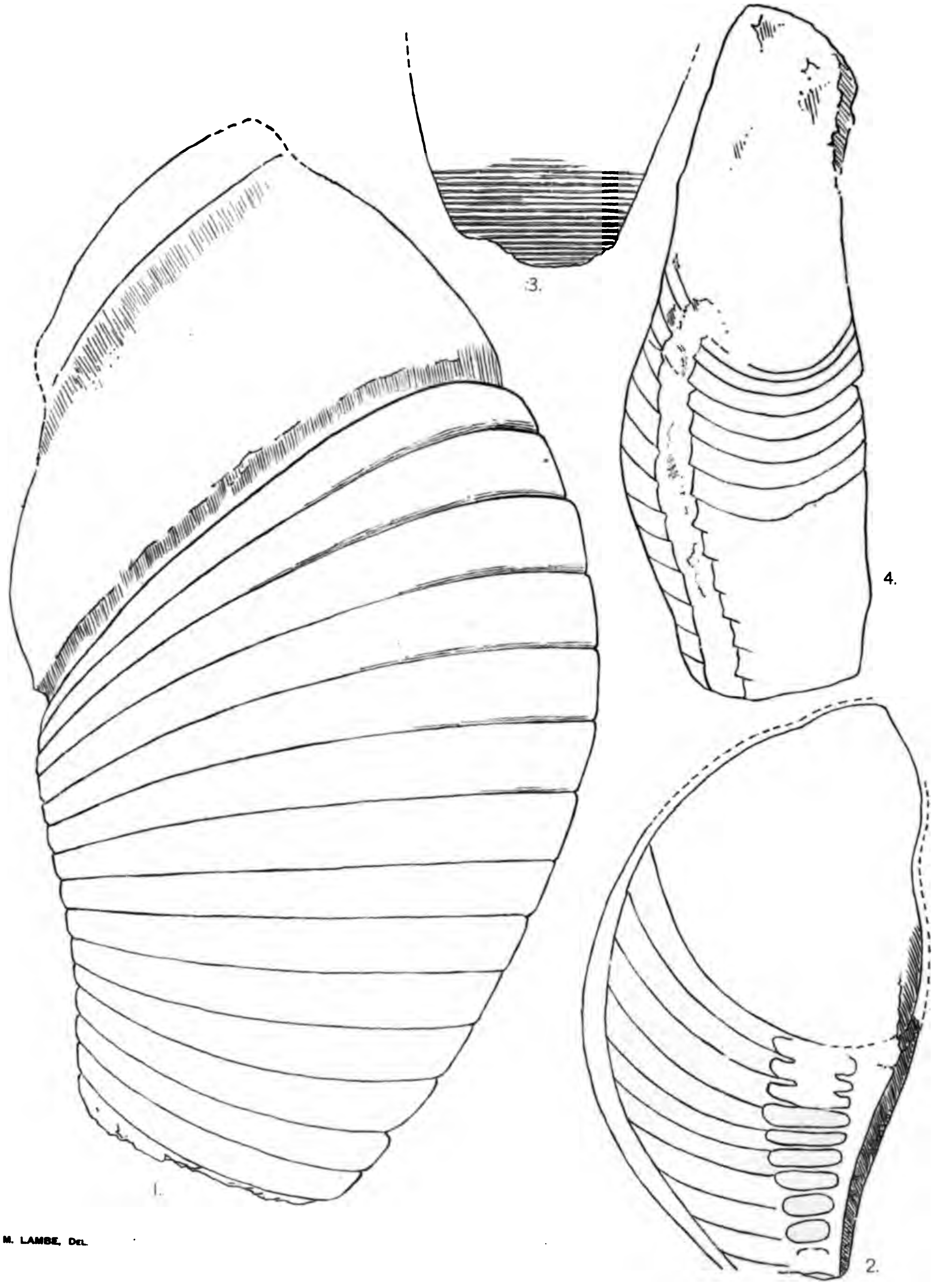


L. M. LAMBE, DEL.

1.—*Poterioceras nobile.*—Side view of a specimen from East Selkirk.

2, 3 and 4.—*Poterioceras apertum.*—(2) Side view of a specimen from Swampy Island ; (3) Similar view of a specimen from Dog's Head ; and (4) Outline of transverse section of another specimen from Dog's Head. All the figures of natural size.

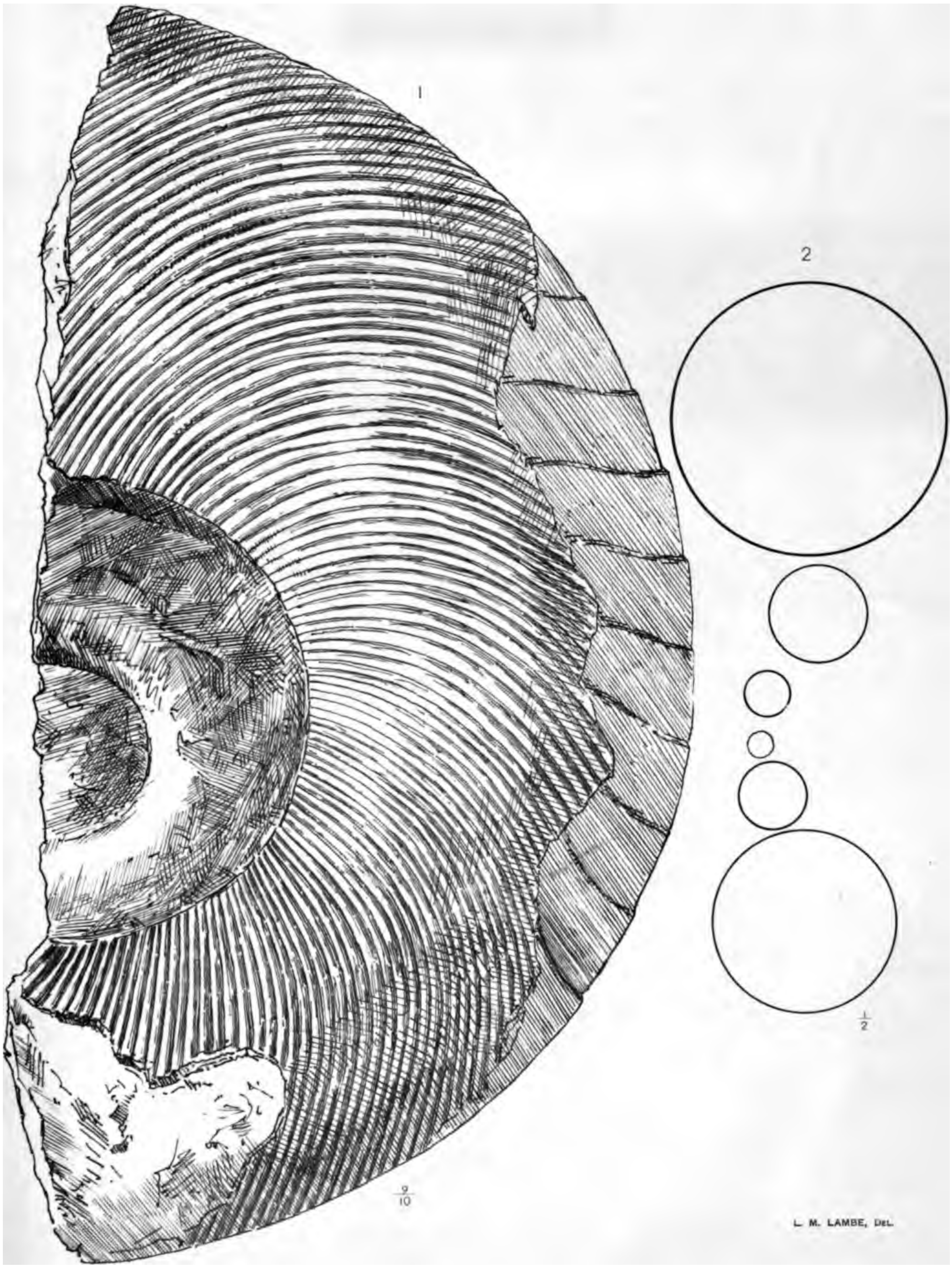
CAMBRO-SILURIAN FOSSILS OF MANITOBA.



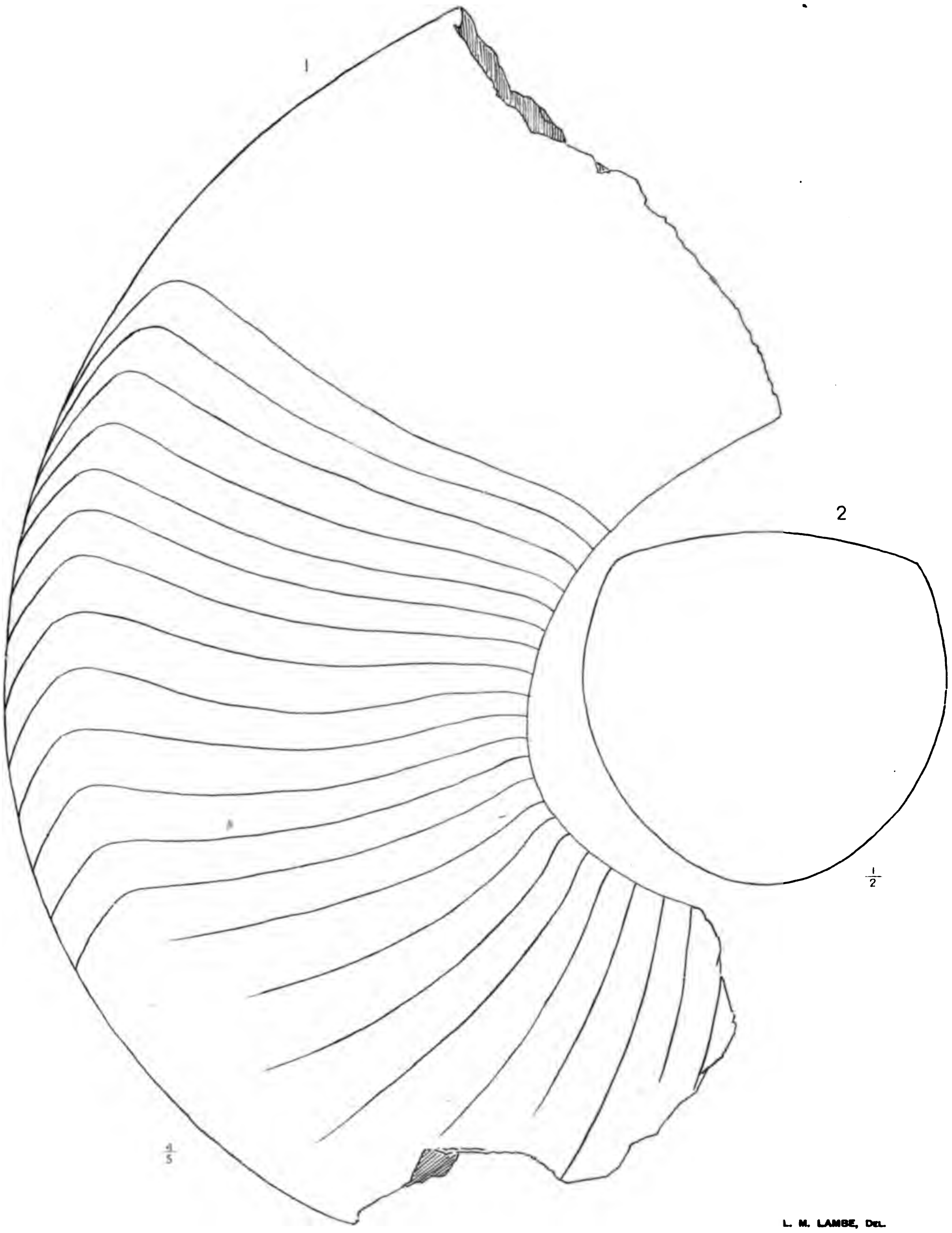
L. M. LAMBE, DEL.

1.—*Oncoceras magnum.*—Side view of a specimen from East Selkirk.

2 and 3.—*Oncoceras gibbosum.*—(2) Longitudinal section of a specimen from Pike Head; and (3) Part of the test of another from Swampy Island. 4.—*Cyrtoceras Manitobense.*—Longitudinal section of a specimen from Bull's Head.



Trochoceras McCharlesi.—(1) Side view of the type of the species, slightly reduced in size; (2) Outline of transverse section of same to show the asymmetry of the volutions.



Apsidoceras insigne.—(1) Side view of the type of the species, slightly reduced in size; (2) Outline of transverse section of the same at the larger end.

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